

Chapter 7 Training

7-1. Overview

The Corps of Engineers has an extensive program for training its personnel in all matters related to its mission in water resources development. Much of the training is directly or indirectly related to dam safety. A comprehensive training program is conducted for dam operation and maintenance personnel. This program is designed to acquaint project personnel with basic engineering considerations pertaining to the major structures, with procedures for surveillance, monitoring and reporting of potential problems, and with emergency operations. The Corps of Engineers has a training course on "Design and Safety Surveillance of Embankment Dams" and supported the development of the Training Aids for Dam Safety (TADS) Program (Walz 1990b). In 1991, the Federal Energy Regulatory Commission initiated a training course on "Emergency Action Plan" (Gotzmer 1991). A listing of Government sponsored training courses relating to dam safety was prepared by the Interagency Committee on Dam Safety (ICODS) Subcommittee on Training (Federal Emergency Management Agency 1986b).

7-2. Training Program for Operations and Maintenance Personnel

a. Dam safety. Recognizing the important role which onsite operations and maintenance personnel have in dam safety, major subordinate command commanders were directed in 1978 to develop a training program which addresses the following items (ER 1130-2-419, United States Committee on Large Dams 1982):

(1) Discussion of basic typical design considerations for various types of construction, including hydraulic considerations and foundation factors.

(2) Procedures for monitoring potential problem areas.

(3) Dam safety features in design and construction.

(4) Normal operation, surveillance, monitoring, and reporting procedures.

(5) Emergency operations, surveillance, monitoring, and reporting procedures.

b. Exercises. Upon completion of the initial safety training at a new project, EAP exercises are developed based on the most probable emergency situations that might occur on each major dam feature. Operations and maintenance personnel are retrained every 4 years.

7-3. Corps of Engineers Training Course on Dam Safety

The Corps of Engineers Proponent Sponsored Engineer Corps Training (PROSPECT) program offers a course titled "Dam Safety in the Corps of Engineers". Through lectures, case histories, and structured student discussions, the course covers all aspects of a dam safety program. The course outlines technical considerations (hydrologic, seismic, geotechnical, electrical/mechanical and structural) as well as the operational requirements (operation, maintenance, surveillance, preparedness, training, and notification). The scope and implementation details of the Dam Safety Assurance Program are covered in detail. Presentations, video modules, case histories, and a walk-through inspection are used to effectively present a multidiscipline approach to the successful monitoring and evaluation of Corps of Engineers dams.

7-4. Training Aids for Dam Safety

a. Background. In 1986, the Corps of Engineers, along with 13 other Federal Agencies, all members of the Interagency Committee on Dam Safety, joined forces to develop a professionally prepared TADS Program. The TADS materials, as shown in Table 7-1, are arranged in three components that cover dam safety inspections, dam safety awareness and program development, and evaluations and remedial

actions (Federal Emergency Management Agency 1992b, Veesaert 1990).

b. Structure. The entire package consists of 21 self-paced individual instruction modules that focus on performance of job tasks. Each module features a workbook text. The material is presented in a straightforward, easy-to-manage manner. Each workbook contains a glossary of terms and a list of references from which to obtain additional information. Nine of the modules are supplemented with videotapes that illustrate certain concepts. Because the modules are self-contained, individuals may tailor a learning

program to meet specific work requirements or personal needs (Federal Emergency Management Agency 1992b, Veesaert 1990).

c. Utilization of the program. The TADS Program promises to offer a standardized approach to dam safety training. The Corps of Engineers, as one of the primary sponsors of the TADS Program, distributes the TADS materials to each Corps of Engineers field office through the Engineering Division, Directorate of Civil Works, HQUSACE. All MSCs and districts should have a complete set of modules including the videotape supplements.

Table 7-1
Training Aids for Dam Safety Modules

Safety Inspection of Dams
(for engineers with little or no inspection experience and technicians with some familiarity with dams)

Preparing to Conduct a Dam Safety Inspection
Documenting and Reporting Findings From a
Dam Safety Inspection
Inspection of Embankment Dams *
Inspection of Concrete and Masonry Dams *
Inspection of the Foundation, Abutments, and
Reservoir Rim
Inspection of Spillways and Outlet Works *
Inspection and Testing of Gates, Valves, and
Other Mechanical Systems *
Instrumentation for Embankment and Concrete
Dams *
Identification of Material Deficiencies *
Evaluation of Facility Emergency Preparedness

Data Review, Investigation and Analysis, and Remedial
Action for Dam Safety (for engineers with some applicability
for dam owners and operators)

The Dam Safety Process
Evaluation of Hydrologic Adequacy
Evaluation of Hydraulic Adequacy
Evaluation of Concrete Dams Stability
Evaluation of Embankment Dams Stability
and Deformation
Evaluation of Seepage Conditions

* Modules have videotape supplements.

Dam Safety Awareness, Organization, and Implementation
(for dam owners and operators, with some applicability
for inexperienced engineers, technicians, administrators,
and the general public)

Dam Safety Awareness *
How to Organize a Dam Safety Program
How to Organize an Operation and Maintenance
Program
How to Develop and Implement an Emergency
Action Plan *
Identification of Visual Dam Safety Deficiencies *